

IN THE SPECIFICATION:

Please amend the following numbered paragraphs as shown:

-- [0002] It is known for no-till sowing machines to include a chain of implements pulled by a tractor. The chain of implements includes a variety of sowing sets equidistantly distributed across the machine according to the number of sowing lines that the machine has. ~~Although~~ Although the designs of the above referred sets may differ according to different manufacturers, models, soil properties, etc., in general they are classified as monodisk and bidisk furrow openers. The first include a furrow-opener disk with a 7 degree leading angle in the travel direction, a levelling wheel next to the opening disk, a tube down which the seed flows into the furrow opened by the furrow opener disk, a seed stepping wheel right behind that enters the furrow to lay the seed at the bottom of the furrow and a closing wheel ending the set which crumbles and presses the soil of the side-wall of the furrow, covering the seed and levelling the surface. In the bidisk opener, the elements are the same, only that the following parts are paired: the furrow opening disk, the levelling and closing wheels, with a 4 degree leading angle in each disk. --

-- [0010] The conventional levelling wheel 11A illustrated in figure 1A includes a 13 tire rim and in its perimeter a 15A treading band is fitted supplied with a 17A contact surface to be in contact with soil 19, as it is shown in figure 2A. The 15A treading band may be solid as well as ~~psemineumatic~~ semipneumatic; in the latter case it has got an 21 internal toroidal hollow to absorb soil surface irregularities and mulching besides 23A internal chords and soften vibrations transmitted to the 25 furrow-opener disk due to those irregularities. --

-- [0021] The treading band of the levelling wheel of the invention is semipneumatic and is provided with a depressed area on the side next to the furrow-opener device, thereby forming an alveolus for ~~receiving~~ receiving almost all the soil removed by the furrow opener, considering that the volume of decompressed soil put aside is greater than in its original state prior to the opening of the ~~furrow~~ furrow. --

-- [0026] According to another aspect of the present invention, a covering wheel is designed for both operating in tandem with the above mentioned levelling wheel in no-till sowing or else ~~independantly~~ independently in other planting machines for conventional sowing. The object of the covering wheel is to take advantage of the little or minor compression of the soil available at the side of the furrow to replace it into the furrow and cover the seeds. This action is performed by a flat treading band which is slanted to the horizontal, which compresses the soil when it is loose and with low humidity. The covering wheel of the present invention is provided with a series of radial conical studs projecting radially outwards, preferably at a slightly slanted angle to the wheel plane (which is perpendicular of its axle), for breaking up clods and properly pressing the soil over the sowing line, leaving a slight ridge of furrow of loose soil on the surface and at the same time operating on thick or thin mulching to close the sowing furrow in any condition normally met in practice. The slant of the flat treading band is slightly greater than the conventional, forming a 30° angle in relation to the horizontal which could be slightly greater or smaller without affecting its performance, whereas the height and diameter at the base of the studs are in relation to the width of the treading band. The studs may have an angle of about 5° measured between the axis of the cone in relation to the wheel plane. --

-- [0036] The structure and construction of the desired model of the levelling wheel 11B of the present invention is illustrated in figure 1B. The levelling wheel 11B contains a conventional tire rim 13 in which perimeter a ~~semineumatic~~ semipneumatic treading band 15B is fitted. The width of the levelling wheel 11B may be between 65 and 115mm, preferably between 90 and 100 mm for most machines available in the market. The treading band 15B has an inside toroidal hollow 21 to absorb unevenness of the terrain and mulching. The treading band has an inner rib to bear vibrations transmitted to the furrow opener 25 due to uneven surfaces of the terrain and bound a treading band ~~per~~ ~~se 17B-~~ 17B on its inner side. --

-- [0037] A perimetral area of the treading band 15B is made up of the contact surface of band 17B – or treading surface in itself – to contact soil 19 and receive the load state F_b represented in figure 2B, able to generate a pressure that fluctuates between 1 and 2 kg/sq cm. If the pressure is too weak (less than [[0,8]] 8.0 kg/sq.cm.), the porous characteristic of the mulch makes the wheel 11B lose contact with the soil 19 modifying the seed depth at random according to the type and thickness of vegetation residues that sometimes cover the soil surface. The other perimetral area of the treading band 15B, which in the assembling stage is fitted next to the furrow-opener 25 as illustrated in figure [[3B]] 4B, shows an alveolar depression 31 in all its perimeter, with a width and depth being about equal as shown in figure 2B, and enough to house all the residue and soil left aside 27B by the furrow opener disk 25 for a medium-major sowing depth, approximately 5cm. From there the treading surface of band 17B per se joins depression 31 displaying a typical bell-shaped or sine-wave form that has to do with the shape naturally adopted by the upraised ridge remains of the open soil of the furrow on which the covering wheel will

operate, reaching the maximum depth of depression or alveolus [[41]] 31 prior to finishing off in a clearing tab 32 bearing against the furrow-opener disk 25. --

-- [0039] More precisely, the width of the treading band 15B is calculated according to the furrow-opener disk 25, as the width of the contact band 17B according to the load transmitted and depth and the width of the depressed 31 of the band [[31]] according to the soil left aside by the furrow-opener disk plus a 30%, taking as a reference a medium working load F_b that could transmit a pressure on the soil 19 of 1.5kg/sq.cm. and a soil movement that could carry out at the medium-major sowing depth- depending on type and design of the furrow-opener disk 25 and for the seed type that the seeder is prepared for – determined by the transversal area of the sowing furrow 29. --

-- [0041] The number of conical studs 45 is related to the perimeter of the band 39 and its size, on its base and height, with the width of the same band 39 that at the same time correlates with the depressed treading band [[31]] 17B of the levelling wheel 11B. The width of the band of the covering wheel 39 spans a proportion of 70% of the width of band 31 of the levelling wheel 11B. The number of studs that the treading band 39 has in its perimeter will result from the division of this into spaces that measure between 1.7 and 2 times the square root of the radius of the wheel 35. The base of the cone of the studs occupies around 90% of the treading band width 39 and the height of cone is within 1 and 1.2 times the base diameter. --

-- [0043] It has been found by means of field samples that the radial conical studs 45 of the closing wheel 35 bring pressure on the potential soil clods or crust that

could be originated by the furrow-opener disk 25 in a soil previously compacted, leaving it smooth and improving the seed-soil contact. In loose soil, the studs 45 easily penetrate, allowing the flat band 39 to make proper contact with the surface and applying enough pressure on the soil to avoid water loss that could affect germination. They can also work among abundant smooth and rough mulching and stalks, perfectly closing the [[the]] sowing furrow 29. It may be wet, loose or dry soil, hardened or covered by abundant smooth or rough mulching, the conical studs 45 in the treading band 39 crumble, press the soil and close the furrow 29 in different mulching amounts and volumes. --

-- [0044] The above-described wheels 11B and 35 are also applicable as depth leveller and sowing furrow closer, respectively, not only in furrow-opener monodisk but also in the one illustrated in figure 7 as well as in the bidisk ones represented in figure 4B. In all cases, the shape and profile on the treading band 15B, 39 of both wheels 11B, 35 combined with the ~~psemineumatic~~ semipneumatic quality of the respective treading band 15B, 39. On the levelling wheel 11B, the treading band itself 17B (between one- and two-thirds of the width of the wheel 11B) steadily supporting on the soil 19e copies the latter level to determine sowing depth, while its ~~psemineumatic~~ semipneumatic composition gives enough resiliency to prevent wet soil adherence and absorb terrain unevennesses without transmitting vibrations to the sowing assembly that could disturb the seed distribution. In the covering wheel, the studs 45 with a conical shape form a suitable angle in relation to the wheel plane 35, with the height and diameter of the base in accordance with the treading band width 39 and the number of these contained in the perimeter, exert a favourable influence on hard soil with clods, excess humidity and abundant surface mulching, optimizing the sowing furrow closure in different soil conditions. --